A NEW INSTRUMENT FOR MEASURING TORSION.[1]

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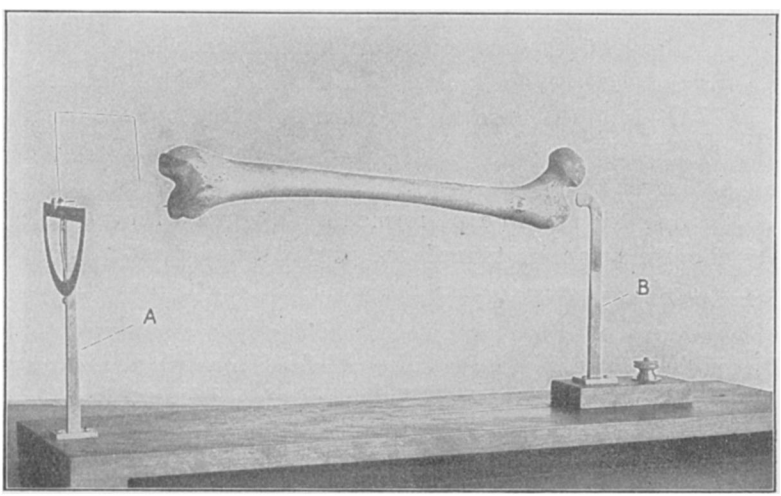
THE apparatus that has heretofore been used to measure the torsion of the long bones of the human skeleton has been so difficult of manipulation as to be impracticable. The following description of a simpler apparatus is offered in the hope that it may prove useful to those who are interested in statistical somatology.

The base is 7 by 30 inches; it is grooved for a distance of 14 inches from the middle to within 2 inches of the right end. The post *A*, 8 inches high, is fixed to the base, and has a spur



projecting 3¼ inches toward the right. An ordinary brass protractor is attached to the top of the post at right angles to the spur. (A protractor with the figures reversed in position would be better.) The center of the protractor is fixed at the axis of the spur, on which is pivoted a U-shaped needle that

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rises 3½ inches above the spur and extends downward externally to the protractor scale. The right end of the needle should terminate in an eye, through which the spur passes ; the figure represents the trial needle not thus arranged.

The post *B* is movable ; its base slides in the groove of the base board and is held in position by a thumbscrew. The top is provided with a strip of steel 3 inches in length. The strip is provided with saw teeth that engage the head and great trochanter of the femur at the same time (or both condyles), for it is pivoted at its center and stands in the plane of the long axis of the bone. This strip is fixed in an exactly vertical position, and the protractor is exactly horizontal in relation to it.

The torsion of any long bones can be measured with this instrument. The axis of each end is first indicated in pencil; the spur of the post *A* is then engaged with the lower portion of the axial line at one end of the bone; the post *B* is pushed to the left until the strip of steel is in contact with the axial line of that end of the bone. With the left hand the needle on post *A* is adjusted so that the arms are in the plane of the axis of the left end of the bone, the end of the needle points to the degree of torsion on the protractor.

The operation can be performed rapidly and with accuracy. As the bone can be turned end for end and remeasured in other positions, we have a ready means of making control measurements. In practice I have not found it necessary to use any support for even fragile bones, but to insure against accident to such material it is advisable, perhaps, to have a narrow table between the posts of the apparatus, which will not support the bone but simply prevent its falling far enough to injure it.

The apparatus can be made by any skilled mechanic. The model figured here was made for me by a graduate student of anthropology, Mr. W. C. Farabee, at Harvard University.

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